DEPARTMENT OF THE ARMY
TECHNICAL MANUAL
DEPARTMENT OF THE AIR
FORCE TECHNICAL ORDER

TM 11-5520
TO 16-45-145

DECADE RESISTOR

TS–679/U

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
FEBRUARY 1952

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DECADE RESISTOR

TS–679/U

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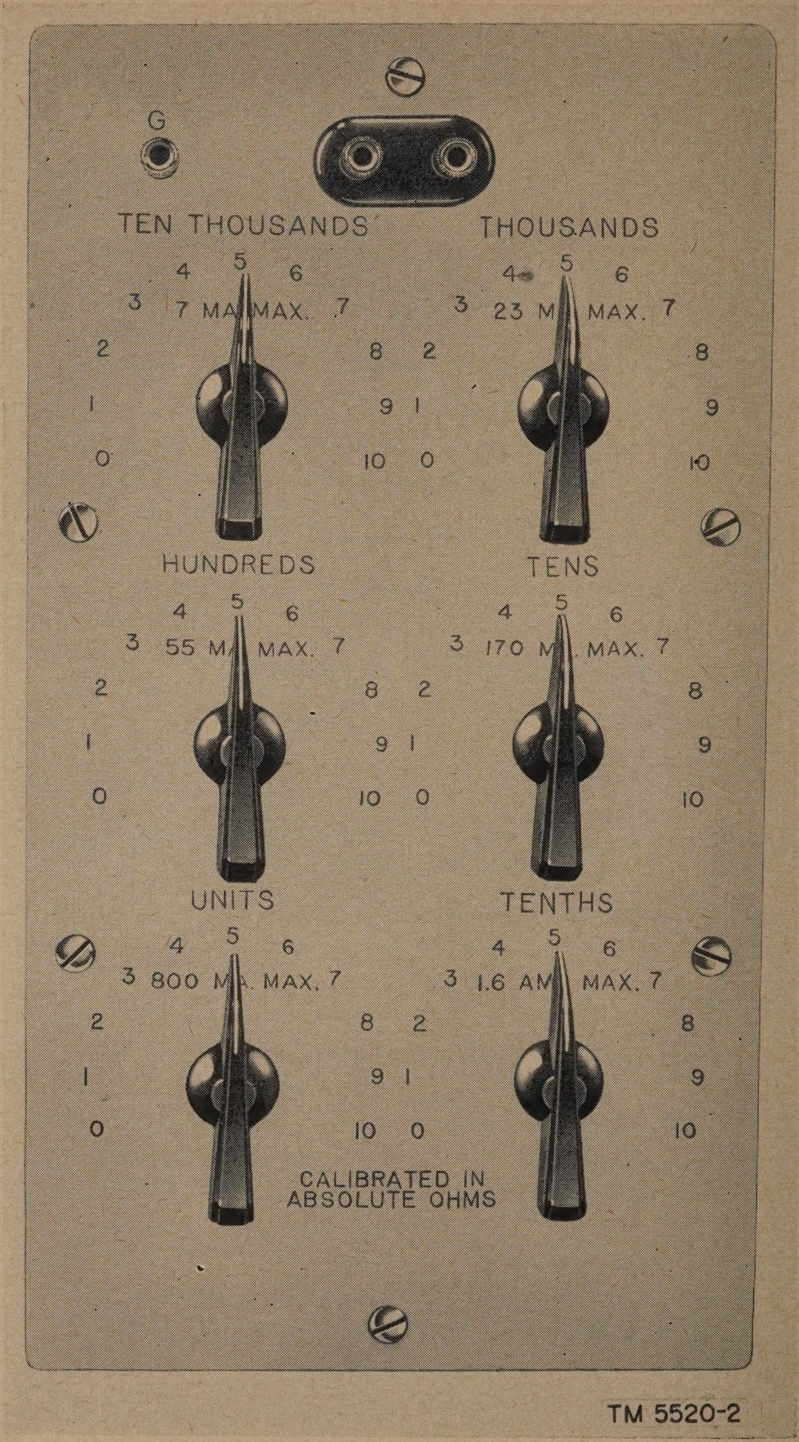


Figure 1. Decade Resistor TS–679/U, front view of panel.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. These instructions contain information on the operation, organizational maintenance, and field maintenance of Decade Resistor TS–679/U, as well as a discussion of the theory of operation. The instructions apply only to Decade Resistor TS–679/U.

b. Appendix I contains a list of current references, including supply catalogs, technical manuals, and other publications applicable to the equipment. Appendix II contains an identification table of parts.

2. Forms and Records

The following forms will be used for reporting unsatisfactory conditions of Army equipment and in performing preventive maintenance:

a. DD Form 6, Report of Damaged or Improper Shipment, will be filled out and forwarded as prescribed in SR 745–45–5.

b. DA AGO Form 468, Unsatisfactory Equipment Report, will be filled out and forwarded to the Office of the Chief Signal Officer, as prescribed in SR 700–45–5.

c. AF Form 54, Unsatisfactory Report, will be filled out and forwarded to Commanding General, Air Matériel Command, Wright-Patterson Air Force Base, Dayton, Ohio, as prescribed in SR 700–45–5 and AFR 65–26.

d. Use other forms and records as authorized.

Section II. DESCRIPTION AND DATA

3. General

a. Decade Resistor TS–679/U (fig. 1) is a single unit designed to provide accurate resistance values between .1 ohm and 111,111 ohms. The equipment is used ordinarily in calibrating a-c (alternating-current) and d-c (direct-current) measuring instruments.

The decade resistor is substituted for the original meter multiplier or shunt resistors, or it is used as a resistance standard for the calibration of ohmmeters. It also may be used in circuits where a wide range of accurately known resistor values is required, where variable dummy generator and load resistances are needed, as ratio arms for d-c and a-c bridges, and for other applications where a precision resistor is necessary in test or repair work.

b. Decade Resistor TS–679/U consists of six decade resistance units connected in series and housed in an aluminum case. It is used with Meter Test Equipment AN/GSM–1B.

4. Description of Decade Resistor TS–679/U

a. PANEL AND CASE. The decade resistor consists of a metal case and an aluminum panel, on which are mounted the decade switches and binding posts.

b. SWITCH KNOBS. Six switch knobs are mounted on the front of the aluminum panel, one for each resistance decade. The knobs are labeled: TEN THOUSANDS—7 MA MAX; THOUSANDS—23 MA MAX; HUNDREDS—55 MA MAX; TENS—170 MA MAX; UNITS—800 MA MAX; and TENTHS—1.6 AMP MAX. Marked in a semicircle around each knob are 11 switch settings: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10, one for each resistance step of the decade. Because of the zero positions, the decades overlap. The label, CALIBRATED IN ABSOLUTE OHMS, is marked between the lower halves of the two bottom switch knobs.

c. BINDING POSTS. Two binding posts mounted on a single insulator at the top center of the panel are used to connect the decade resistor to an external circuit. A single binding post to the left of these two binding posts is labeled G; it may be connected to an external ground to prevent a-c pick-up.

5. Technical Characteristics

Resistance range	0.1 ohm through 111,111 ohms.
Number of decades	6.
Contacts per decade	11.
Zero d-c (direct-current) resistance	0.010 ohm to .015 ohm.
Resistor windings:	
TENTHS, UNITS and TENS decades	Manganin wire with a temperature coefficient of ±.002 percent per degree between 20° C and 100° C.

HUNDREDS, THOUSANDS, and TEN THOUSANDS decades______________Karma wire with a temperature coefficient of ±.002 percent per degree between 20° C and 100° C.

Switches__________________rotary; 11 silver-alloy contacts, contact resistance between .002 and .003 ohm; effective capacitance less than 5 $\mu\mu$f.

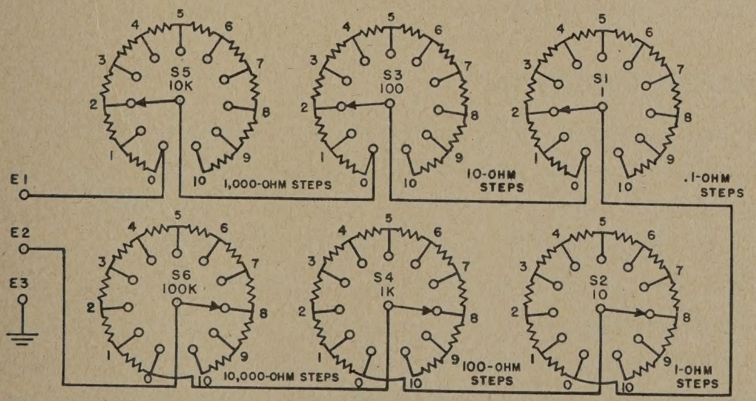
Decade units (fig. 2):

Decade (ohm)	Steps	Ohms per step	Accuracy* (%)	Maximum current (ma)	Maximum inductance (mh)
1	10	.1	±1.	1,600	----
10	10	1,000	± .25	800	.056
100	10	10	± .1	170	.11
1,000	10	100	± .1	55	.29
10,000	10	1,000	± .1	23	3.3
100,000	10	10,000	± .1	7	9.5

* These accuracies hold for temperatures from 32° F. to 132° F. for dc, and for ac (alternating current) up to 50 kc (kilocycles).

6. Weight and Packaging Data

Unpacked, Decade Resistor TS–679/U weighs approximately 4.2 pounds. When packaged for export shipment, the decade resistor is placed in a moisture-vaporproof container and packed in a wooden crate.



NOTES:
1. ALL VALUES IN OHMS.
2. ALL SWITCHES ARE VIEWED FROM FRONT OF PANEL.

TM5520-3

Figure 2. Decade resistor TS–679/U, schematic diagram.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

7. Uncrating, Unpacking, and Checking New Equipment

Decade Resistor TS–679/U is a component of Meter Test Equipment AN/GSM–1B. For uncrating, unpacking, and checking instructions, refer to chapter 2, TM 11–2535A covering Meter Test Equipment AN/GSM–1B.

Caution: Be very careful when uncrating, unpacking, or handling the decade resistor; it is damaged easily.

8. Uncrating, Unpacking, and Checking Used or Reconditioned Equipment

a. Follow the instructions in paragraph 7 for uncrating and unpacking used or reconditioned equipment.

b. Check the equipment for tags or other indications that wiring has been changed. If any changes have been made, note them in this manual, preferably on the schematic diagram (fig. 2).

c. Check the switch knobs for ease of operation.

9. Locating Equipment

The best location for test equipment depends on the tactical situation and local conditions. Therefore, the recommendations in this paragraph are to be used only as a guide. The shelter for this equipment should meet the following requirements:

a. Sufficient space must be available for possible repair work.

b. Adequate lighting must be provided for day and night operation. Position the equipment so that the panel designations may be read easily by operating personnel. If artificial lighting is used, place the light bulbs so that the light falls directly on the panel. A portable drop lamp and extension cord are convenient assets for operating and maintenance personnel.

Section II. OPERATION UNDER USUAL CONDITIONS

10. Controls

(fig. 1)

Control	Function
TEN THOUSANDS switch.	Places up to 100,000 ohms in the circuit in ten 10,000-ohm steps.
THOUSANDS switch.	Places up to 10,000 ohms in the circuit in ten 1,000-ohm steps.
HUNDREDS switch.	Places up to 1,000 ohms in the circuit in ten 100-ohm steps.
TENS switch.	Places up to 100 ohms in the circuit in ten 10-ohm steps.
UNITS switch	Places up to 10 ohms in the circuit in ten 1-ohm steps.
TENTHS switch.	Places up to 1 ohm in the circuit in ten .1-ohm steps.

11. Preoperation Procedures

Whenever Decade Resistor TS–679/U is in use, it should be grounded by means of the G binding post on the front panel. To avoid burning out or damaging any of the decade components, always check the maximum current or voltage to be applied before connecting the decade resistor in the circuit. If the voltage to be applied is not known, measure it. The maximum permissible current for each decade is marked on the front panel above each switch knob (fig. 1). To determine the maximum permissible voltage for a decade, multiply the total resistance of that decade by the maximum current. For example, voltage for the UNITS decade is 10 times .8, or 8 volts; for the TENS decade, it is 100 times .17, or 17 volts. Remember that these voltages are permissible only when all 10 decade resistors are placed in the circuit. If only nine of the resistors are in the circuit, only nine-tenths of the calculated voltage may be used; if only three of the resistors are in the circuit, then only three-tenths of the calculated voltage may be used.

Caution: If there is a possibility that the voltage to be applied is higher than the calculated permissible voltage, do not, under any circumstances, connect Decade Resistor TS–679/U in the circuit. Failure to observe this precaution may result in damage to the equipment.

12. Adjusting Decade Resistor TS–679/U

The decade resistor is adjusted to various values of resistance by the six control knobs on the front panel (fig. 1). All six decade units are connected in series (fig. 2) so that the actual reading across the terminals is obtained by adding the readings of the six dials. For all practical applications, the 0 setting of any dial is considered to be zero resistance. To adjust the value of resistance between zero and one ohm in .1-ohm steps, adjust the setting of the TENTHS knob between 0 and 10. To adjust the value of resistance between zero and 10 ohms in 1-ohm steps, adjust the setting of the UNITS knob between 0 and 10. Similarly, the TENS knob may be adjusted between zero and 100 ohms, the HUNDREDS knob between zero and 1,000 ohms, the THOUSANDS knob between zero and 10,000 ohms, and the TEN THOUSANDS knob between zero and 100,000 ohms.

Example: To set Decade Resistor TS–679/U at 85,746.6 ohms, adjust the TENTHS knob to 6, the UNITS knob to 6, the TENS knob to 4, the HUNDREDS knob to 7, the THOUSANDS knob to 5, and the TEN THOUSANDS knob to 8.

13. Using Decade Resistor TS–679/U as Standard Resistor

a. Check to be sure that the voltage to be applied is within the permissible range (par. 11).

b. Turn off the power in the circuit to be used.

c. Set up the desired resistance on the decade control knobs, and connect the decade resistor to the circuit by binding posts E1 and E2 (fig. 2).

d. Turn on the power in the circuit.

14. Using Decade Resistor TS–679/U as a Load or Terminating Resistor

a. WHEN OUTPUT IMPEDANCE IS KNOWN. Set the decade resistor at a resistance value equal to output impedance of the equipment to which it is to be connected. Load resistance must always be equal to output impedance if maximum output power is to be delivered. In most cases, the output impedance is known. Using the two insulated binding posts as terminals, connect the decade resistor to the circuit in which it is to serve as a load or terminating resistance.

b. WHEN OUTPUT IMPEDANCE IS NOT KNOWN. When output impedance is not known, measure it by connecting an output meter or a milliammeter of the proper current-carrying capacity to the external circuit.

(1) If an output meter is used, adjust the meter impedance control until maximum output in mw (milliwatts) or db (decibels) is obtained. The impedance value for which the meter is set when output is greatest is the proper load resistance. Disconnect the output meter; set the decade resistor at proper load resistance value and connect it to the circuit.

(2) If a milliammeter is used, connect the decade resistor, as well as the milliammeter, to the external circuit. Then measure output at several different values of load resistance, alternately setting the decade resistor and measuring the current. Output power is the resistance times the square of the current in amperes. The greatest output will be obtained at the proper value of load resistance. After the proper resistance has been determined, set the decade resistor at that value, and disconnect the milliammeter from the circuit.

Note. If the impedance to be determined is entirely unknown, measure the output at large resistance intervals. For example, measure the output of an amplifier at 50, 150, 250, and 500 ohms. If the output at 250 ohms is greater than at any of the other values used, measure output at 200 and 300 ohms. If output is still maximum at 250 ohms, measure at 240 and 260 ohms. If 250 ohms still provides maximum output, it is the proper terminating resistance.

15. Using Decade Resistor TS–679/U to Check Resistors by Substitution

a. If the value of the unknown resistor can be estimated approximately, proceed as follows:

(1) Obtain a milliammeter and a battery. Determine that current will be within the meter range by dividing the battery voltage by the estimated value of the resistor. If necessary, change the battery voltage.

(2) Connect the unknown resistor in series with the battery and milliammeter.

(3) Read current on the milliammeter scale, and make a note of the current value.

(4) Turn all knobs of the decade resistor to maximum. Disconnect the unknown resistor, and connect the decade resistor in series with the battery.

(5) Beginning with the TEN THOUSANDS knob, turn resistance of the decade resistor down gradually until the

current reading noted in (3) above is obtained on the meter. Reading of the decade resistor at this point is the value of the unknown resistor.

b. If the value of the unknown resistor cannot be estimated, proceed as follows:

(1) Connect the decade resistor, with all decades set at maximum, in series with the unknown resistor.

(2) Connect a battery and milliammeter in series with both resistors.

(3) While watching the current reading of the meter, turn the resistance of the decade resistor down gradually (*a*(5) above). If all decades can be reduced to zero without causing the current reading to go off full scale, leave the decade resistor at zero and note the current reading.

Note. If the resistance to be measured is of such high value that no readable current flows through the milliammeter, use a microammeter. If the decade resistor cannot be reduced to zero before the meter goes off full scale, use an ammeter. In any case, be sure not to overload either the meter or the decade resistor.

(4) Turn all decades of the decade resistor to maximum again, and short out the unknown resistor or disconnect it.

(5) Gradually reduce resistance of the decade resistor (*a*(5) above) until the current reading is the same as that noted in (3) above. The value of the unknown resistor is the same as the reading of the decade resistor at this point.

Note. To use the decade resistor in testing and calibrating meters, refer to TM 11–2535A and TM 11–4700.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

16. General

The operation of Decade Resistor TS–679/U may be difficult in regions where extreme climatic conditions prevail. The following paragraphs contain instructions for minimizing the effect of these conditions.

17. Operation in Arctic Climates

Subzero temperatures and the climatic conditions associated with cold weather lower the efficiency of the decade resistor. Proceed as follows when it is necessary to operate the equipment in an arctic climate:

a. Handle the equipment carefully. Extreme cold may make some parts brittle.

b. Locate the equipment in a heated inclosure, if possible, so that cold drafts cannot strike it. If the inclosure is constructed so that this precaution is impossible, place a blanket or some barrier between the source of the draft and the equipment.

c. Keep the equipment dry. If is not in a heated inclosure, construct an insulated box for it. If resistor heaters are supplied, keep them turned on, but be sure that use of the heaters does not overtax the power supply.

d. When the equipment has been exposed to the cold, it will start to sweat when it is brought into a warm room. It also will start to sweat when it warms up during the day after exposure during a cold night. When the equipment has reached room temperature, dry it thoroughly.

18. Operation in Tropical Climates

In tropical climates, test equipment may be installed in tents, huts, or in underground dugouts. When equipment is installed below ground or set up in swampy areas, moisture conditions are especially bad. Ventilation is usually very poor, and the high relative humidity causes condensation of moisture on the equipment whenever the temperature of the equipment becomes lower than that of the ambient air. To minimize the moisture condition, place the equipment on a raised open frame, and set a lighted electric bulb under it.

19. Operation in Desert Climates

a. Should conditions similar to those encountered in tropical climates prevail in desert areas, follow the instructions given in paragraph 18.

b. The most serious problem in desert areas is the amount of sand, dust, and dirt that enters moving parts of the equipment. If possible, house the equipment in a dustproof shelter. However, since such a building is seldom available and would require air conditioning, the next best precaution is to make the building in which the equipment is housed as dustproof as possible. Hang wet sacking over the windows and doors, cover the inside walls with heavy paper, and secure the side walls of tents with sand to prevent their flapping in the wind.

c. Never tie cords or other wiring connections to either the inside or outside of tents. Desert areas are subject to sudden wind squalls that may jerk the connections or break the leads.

d. Make frequent preventive maintenance checks (par. 24).

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. PRESERVATION

20. Preventive Maintenance Tools and Materials

The following organizational tools and materials are used to perform preventive maintenance:

Common hand tools
Solvent, dry-cleaning (SD)
Tool Equipment TE–41

21. Weatherproofing

a. GENERAL. Signal Corps equipment, when operated under severe climatic conditions such as prevail in tropical, Arctic, and desert regions, requires special treatment and maintenance. Fungus growth, insects, dust, corrosion, salt spray, excessive moisture, and extreme temperatures are harmful to most materials.

b. TROPICAL MAINTENANCE. A special moistureproofing and fungiproofing treatment has been devised which, if properly applied, provides a reasonable degree of protection. This treatment is explained fully in TB SIG 13 and TB SIG 72. When fungiproofing test equipment, be sure to mask all switches before spraying on lacquer.

c. WINTER MAINTENANCE. Special precautions necessary to prevent poor performance or total operational failure of equipment in extremely low temperatures are explained fully in TB SIG 66 and TB SIB 219.

d. DESERT MAINTENANCE. Special precautions necessary to prevent equipment failure in areas subject to extremely high temperatures, low humidity, and excessive sand and dust are explained fully in TB SIG 75.

Section II. PREVENTIVE MAINTENANCE SERVICES

22. Meaning of Preventive Maintenance

Preventive maintenance is work performed on equipment, usually when it is not in use, to keep it in good working order so that breakdowns and needless interruptions will be kept at a minimum. The purpose of preventive maintenance is to keep at a minimum the need for trouble shooting and repair.

23. Preventive Maintenance Techniques

a. Use No. 000 sandpaper to remove corrosion.

b. Use a clean, dry, lint-free cloth or a brush for cleaning. Moisten the cloth or brush with solvent (SD), clean the equipment, *except for electrical contacts,* and then wipe the parts dry with a fresh cloth. Clean the electrical contacts with a cloth moistened with carbon tetrachloride, and wipe the contacts dry with a fresh cloth.

c. If dry, compressed air is available, it may be used at a line pressure not exceeding 40 pounds per square inch to remove dust from inaccessible places in the equipment. If compressed air is used, be very careful not to damage the equipment.

d. Do not tighten screws or nuts carelessly. Fittings tightened beyond the pressure for which they were designed will be damaged or broken.

24. Preventive Maintenance Services

a. DAILY SERVICES.

(1) Clean the exterior of the metal case and the panel face.
(2) Check operation of the switches for looseness or binding.

b. WEEKLY SERVICES. Disconnect all leads (fig. 3) before performing these operations.

(1) Clean the interior of the case, the switch surfaces, and the binding posts.
(2) Check action of the switch fingers to insure that they are making contact.

c. MONTHLY SERVICES. Check the following and tighten and/or clean, if necessary:

(1) Binding posts for dirt or corrosion.
(2) Switches for blistering, discoloration, and other evidence of overheating; and for dirt, corrosion, loose contacts, and unsatisfactory mechanical action.
(3) Mountings, machine screws, and rubber feet for mechanical looseness.
(4) All terminals and connections for looseness and corrosion.
(5) Moistureproofing and fungiproofing coatings for breaks. Retouch with varnish and a brush, if necessary.
(6) Case finish for scratches and bare spots. Retouch if necessary (par. 34).

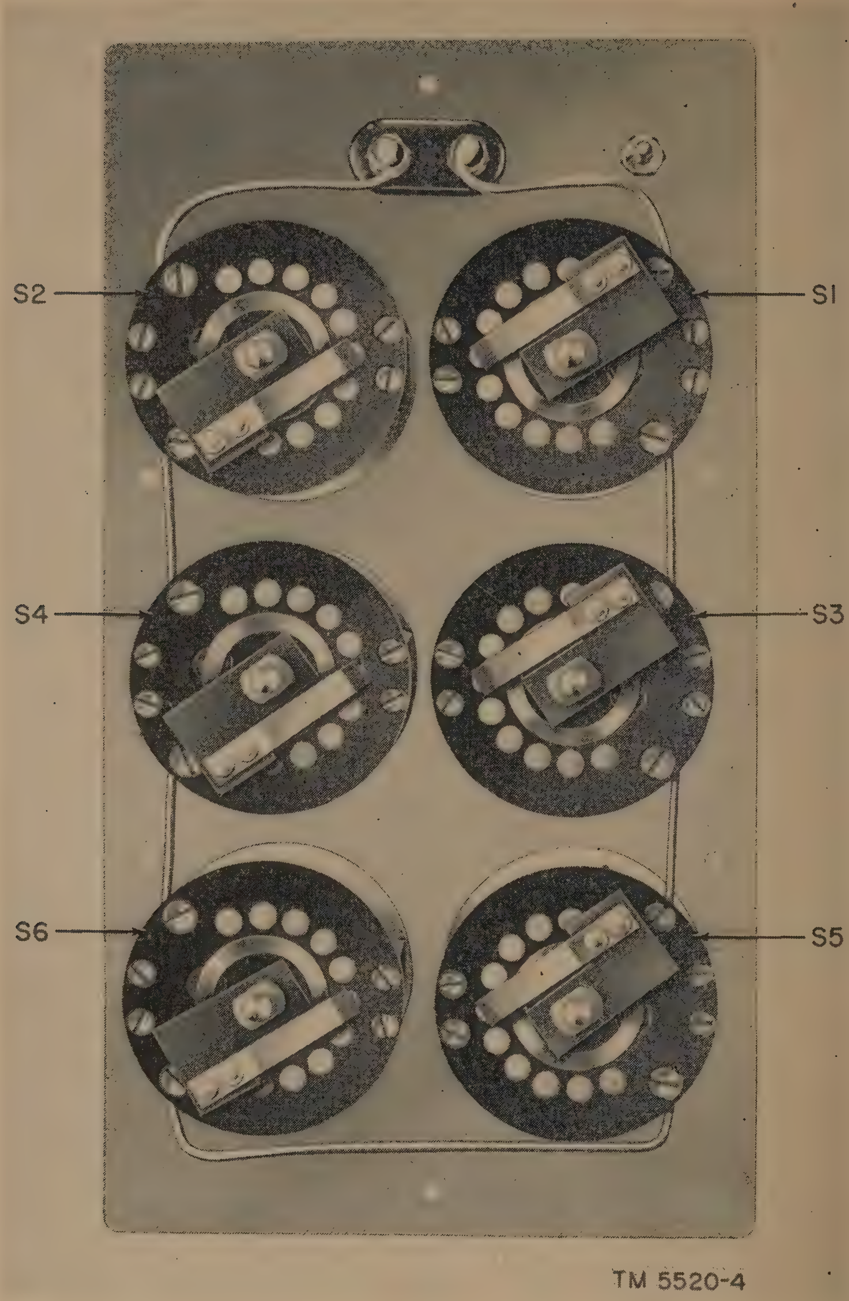


Figure 3. Decade Resistor TS–679/U, rear view of panel.

CHAPTER 4
FIELD MAINTENANCE INSTRUCTIONS

Section I. GENERAL

25. Field Maintenance Services

a. SCOPE. The repair instructions that follow are intended for use by field maintenance personnel trained and equipped to handle repairs that require special equipment not generally available to organizational maintenance personnel.

b. PURPOSE. The scope of repairs that may be performed by units having field maintenance responsibility is limited only by the tools and test equipment available and by the skill of assigned personnel.

26. Tools, Materials, and Test Equipment

The following tools, materials, and test equipment are required for the repair procedures given in this chapter:

Common hand tools
Multimeter TS–352/U
Soldering iron
Solvent, dry-cleaning (SD)
Test Set I–49

27. Theory of Operation

Decade Resistor TS–679/U is designed primarily for d-c and a-f (audio-frequency) applications. All resistors are wound with a special alloy wire to minimize thermal effect in d-c measurements. The equipment also may be used in the r-f (radio-frequency) range. At radio frequencies, however, residual inductances and capacitances cause the effective series reluctance at the terminals to vary. In no case is the error serious at frequencies below 50 kc (kilocycles). When the decade resistor is connected in a test circuit, it presents a simple series resistance to any potential applied to binding posts E1 and E2 (fig. 2). The required resistance is obtained by setting the six switch knobs at the proper positions.

Section II. TROUBLE LOCATION

28. General Precautions

Whenever Decade Resistor TS–679/U is serviced, observe the following precautions:

a. When replacing a part, be careful not to damage other parts.

b. Before a part is unsoldered, note the position of leads so that they may be replaced in the positions from which they were removed. Be careful not to disturb other leads by pulling or pushing them.

c. Do not allow drops of solder to fall into the equipment. It may cause a short circuit or change the resistance of the decades.

d. Be sure to use sufficient solder, and make well-soldered joints. A poorly soldered joint is a difficult fault to locate.

e. When replacing any wire, use the same or larger gage wire of the same length. Failure to do so may result in increased resistance in the circuit.

29. Cleaning and Inspecting

a. CLEANING. Thorough cleaning of the equipment will insure optimum performance by preventing corrosion and dirt from causing arc-over or low-resistance leakage between high-voltage points and ground. Remove loose dust and dirt with a brush or blower. Remove dirt and grease that adheres to the chassis and other parts with a cloth or brush and solvent (SD). Clean the switches, *but not the electrical contacts,* with a brush or pipe cleaner and solvent (SD). Clean electrical contacts with a brush dipped in carbon tetrachloride, and then dry the contacts by wiping them with a clean cloth.

b. INSPECTING. After the decade resistor has been cleaned, inspect it visually for the following:

(1) Corrosion.
(2) Loose connections or screws.
(3) Defective binding posts or switch contacts.
(4) Broken wires.
(5) Charred resistor coils.
(6) Other parts of the equipment that show abnormalities.

30. Trouble-shooting Procedures

If the decade resistor fails to operate satisfactorily after having been cleaned carefully and inspected visually, make the following checks:

a. RESISTANCE MEASUREMENTS. These measurements will help to localize the trouble to one or more of the six resistance decades. Measurements should be made with a highly accurate bridge, such as Test Set I–49.

(1) Set all six switches at the zero position.

(2) Connect the bridge to binding posts E1 and E2.

(3) Set the bridge at its most sensitive range, and note the reading. The reading should not exceed .015 ohm.

(4) Turn the TENTHS switch knob clockwise one step at a time, and note the bridge reading for each step. The reading should correspond to the value indicated by the switch setting.

(5) Turn the TENTHS switch back to the 0 setting, and repeat the procedure in subparagraph (4) above for the UNITS switch.

(6) Check the TENS, HUNDREDS, THOUSANDS, and TEN THOUSANDS switches by following the procedure in (4) above. When checking any of one of the switches, be sure that all the other switches are set at 0.

(7) Replace any defective resistance decade as a unit. The decades are accurately calibrated units and should not be repaired.

b. INTERMITTENTS. Check for intermittents by tapping or jarring the equipment and observing the bridge reading at various switch settings.

31. Operational Test

After any defective part has been replaced, test the decade resistor to ascertain that it is accurate. Check by following the procedures in paragraph 30*a*.

Section III. REPAIRS

32. Replacement of Decade

(fig. 3)

Before replacing any parts, remove the panel from the case.

a. Remove the soldered connection by using a soldering iron. Be sure to label leads so they may be replaced properly.

b. Remove the switch knob by removing the nut and lockwasher that hold it in place, and pull out the decade.

c. Install a new decade by reversing the procedure given in *a* and *b* above.

33. Replacement of Binding Post
(fig. 4)

a. Remove the soldered connection by using a soldering iron.

b. Remove the nut and lockwasher that hold the binding post in place, and pull out the binding post.

c. Install a new binding post by reversing the procedure given in *a* and *b* above.

34. Refinishing

When the finish on the case has been scarred or damaged, or when corrosion is visible, a touch-up job is required. Use No. 00 or No. 000 sandpaper to clean the scarred portion of the surface down to the bare metal; be sure to obtain a bright, smooth finish. Remove rust by cleaning the corroded metal with solvent (SD). In severe cases, it may be necessary to use sandpaper after cleaning with solvent (SD). Apply paint to the cleaned or sanded portions with a small brush. Use paint authorized by existing regulations.

CHAPTER 5

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

35. General

The exact procedure used in repacking for shipment or limited storage depends on the material available and the conditions under which the equipment is to be stored or shipped. Insofar as possible, repack the equipment in the manner in which it was packed originally (see TM 11–2535A for Meter Test Equipment AN/GSM–1B).

36. Repacking Procedures

Whenever possible, place a dehydrating agent such as silica gel inside the packaging. Inclose the equipment in a waterproof paper barrier, and seal the barrier with waterproof sealing compound or tape. Pack the waterproofed equipment in a padded wooden case, and provide at least 3 inches of excelsior padding or some similar material between the paper barrier and the walls of the packing case.

Section II. DEMOLITION TO PREVENT ENEMY USE

37. Methods of Demolition

a. SMASH. Use sledges, axes, handaxes, pickaxes, hammers, crowbars, heavy tools.

b. CUT. Use axes, handaxes, machetes.

c. BURN. Use gasoline, kerosene, oil, flame throwers, incendiary grenades.

d. EXPLODE. Use firearms, grenades, TNT.

e. DISPOSE. Bury in slit trenches, fox holes, other holes. Throw into streams. Scatter.

Note. Use anything immediately available for destruction of this equipment.

38. Destruction of Components

When ordered by your commander, destroy all equipment to prevent its being used or salvaged by the enemy.

a. Smash (par. 37*a*) the case, controls, decades, and binding posts.

b. Cut (par. 37*b*) wires.

c. Burn (par. 37*c*) the decades and technical manuals.

d. Bury or scatter (par. 37*e*) all remaining parts of the equipment.

e. Destroy everything.

APPENDIX I

REFERENCES

Note. For availability of items listed, check SR 310–20–3, SR 310–20–4, and SR 310–20–5.

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1. Regulations

a. ARMY.

AR 380–5	Safeguarding Military Information.
AR 750–5	Maintenance of Supplies and Equipment: (Maintenance Responsibilities and Shop Operation).

b. SPECIAL.

SR 310–20–3	Index of Training Publications.
SR 310–20–4	Index of Technical Manuals, Technical Regulations, Technical Bulletins, Supply Bulletins, Lubrication Orders, Modification Work Orders, Tables of Organization and Equipment, Reduction Tables, Tables of Allowances, Tables of Organization, and Tables of Equipment.
SR 310–20–5	Index of Administrative Publications.
SR 700–45–5	Unsatisfactory Equipment Report (Reports Control Symbol CSGLD–247).
SR 745–45–5	Report of Damaged or Improper Shipment (Reports Control Symbol CSGLD–66).

2. Supply Publications

SB 11–47	Preparation and Submission of Requisitions for Signal Corps Supplies.
SB 11–100	Serviceability Standards for Signal Equipment in Hands of Troops.

3. Technical Manuals on Auxiliary Equipment and Test Equipment

TM 11–2535A	Meter Test Equipment AN/GSM–1B.
TM 11–4700	Electrical Indicating Instruments and Test Sets, Repair Instructions.

4. Painting, Preserving, Maintenance, and Lubrication

TB SIG 13	Moistureproofing and Fungiproofing Signal Corps Equipment.
TB SIG 66	Winter Maintenance of Signal Equipment.
TB SIG 72	Tropical Maintenance of Ground Signal Equipment.
TB SIG 75	Desert Maintenance of Ground Signal Equipment.
TB SIG 123	Preventive Maintenance Practices for Ground Signal Equipment.
TB SIG 219	Operation of Signal Equipment at Low Temperatures.

5. Packaging and Packing Information

a. MILITARY (MIL AND JAN) SPECIFICATIONS.

JAN–P–100	Packaging and Packing for Overseas Shipment —General Specification.
JAN–P–116 (2)	Packaging and Packing for Overseas Shipment —Preservation, Methods of.
JAN–P–125 (1)	Packaging and Packing for Overseas Shipment —Barrier-Materials, Water-Proof, Flexible.
MIL–B–131A	Barrier-Material; Water-Vaporproof, Flexible.

b. U. S. ARMY SPECIFICATION.

100–2E	Marking Shipments by Contractors, Standard Specifications for.

APPENDIX II
IDENTIFICATION TABLE OF PARTS

Note. The fact that a part is listed in this table is not sufficient basis for requisitioning the item. Requisitions must cite an authorized basis, such as a specific T/O&E, T/A, SIG 7 & 8, list of allowances of expendable material, or other authorized supply basis. The Department of the Army Supply Catalog applicable to the equipment covered in this manual in SIG 7 & 8–TS 679/U. For an index of available supply catalogs in the signal portion of the Department of the Army Supply Catalog, see the latest issue of SIG I.

Ref Symbol	Name of part and description	Function of part	Signal Corps stock No.
C	DECADE RESISTOR TS–679/U.	Provides precision resistances between .1 ohm and 111,111 ohms.	3F1800–5
E4	INSULATOR, bushing: ¾″ wd x 15/64″ lg; two 3/16″ dia holes on ¾″ ctr.	Provides panel mounting for binding posts E1 and E2.	3GK1837–24.6
	KNOB: for ¼″ dia shaft.	Serves as switch knob for each resistance decade.	2Z5824.18
E1, E2, E3	POST, binding: screw type; 5/32″ max wire hole.	Used to connect decade resistor to external circuit.	3Z741–38
S1	RESISTOR, decade: 1 ohm in steps of .1 ohm.	Provides resistance of 1 ohm in steps of .1 ohm.	3F1800–4.2
S2	RESISTOR, decade: 10 ohms in steps of 1 ohm.	Provides resistance of 10 ohms in steps of 1 ohm.	3F1800–4.3
S3	RESISTOR, decade: 100 ohms in steps of 10 ohms.	Provides resistance of 100 ohms in steps of 10 ohms.	3F1800–4.4
S4	RESISTOR, decade: 1,000 ohms in steps of 100 ohms.	Provides resistance of 1,000 ohms in steps of 100 ohms.	3F1800–4.5
S5	RESISTOR, decade: 10,000 ohms in steps of 1000 ohms.	Provides resistance of 10,000 ohms in steps of 1,000 ohms.	3F1800–4.6
S6	RESISTOR, decade: 100,000 ohms in steps of 10,000 ohms.	Provides resistance of 100,000 ohms in steps of 10,000 ohms.	3F1800–4.7
0–1, 0–2, 0–3, 0–4, 0–5, 0–6	SPRING: 16 turns; helical extension.	Serves as detent spring.	2Z8877.623

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